

WHAT IS CLAIMED IS:

1. An image encoding device comprising:

a transformation component which transforms given image data into transformation coefficients by subjecting this data to a frequency decomposition,

a dividing component which divides the transformation coefficients produced by the transformation component into a selected region on the image and a non-selected region other than the selected region, and

an encoding component which encodes the transformation coefficients by preferentially allocating a greater quantity of information to the selected region than to the non-selected region, wherein

the dividing component performs an equation evaluation of numerical equation data that stipulates the boundary of the selected region, and determines whether the transformation coefficients belong to the selected region on the basis of the results of the equation evaluation.

2. The image encoding device of claim 1, wherein the dividing component comprises:

a numerical equation preparation component which performs an edge detection for the image data, determines an outline on the basis of the results of this edge detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

3. The image encoding device of claim 1, wherein the dividing component comprises:

a numerical equation preparation component which performs a color boundary

detection for the image data, determines an outline on the basis of the results of this color boundary detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

4. The image encoding device of claim 1, wherein the dividing component comprises:
a numerical equation preparation component which performs a space frequency component detection for the image data, determines an outline on the basis of the results of this space frequency component detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

5. The image encoding device of claim 1, wherein the encoding component forms a compressed image file from the combined encoded transformation coefficients and the numerical equation data used by the dividing component.

6. An image decoding device which decodes the compressed image file compressed by the image encoding device of claim 5, wherein the image decoding device comprises:

a decoding component which reads out the encoded transformation coefficients from the compressed image file and decodes these transformation coefficients,

a re-dividing component which reads out the numerical equation data from the compressed image file, performs an equation evaluation, and makes a judgement on the basis of

the results of this equation evaluation as to whether the transformation coefficients decoded by the decoding component belong to the selected region,

an adjustment component which adjusts the form of expression of the transformation coefficients in the selected region and the form of expression of the transformation coefficients in the non-selected region in accordance with the division of the re-dividing component, and

a reverse transformation component which performs a reverse transformation on the image data using the transformation coefficients whose forms of expression have been adjusted by the adjustment component as sub-band components.

7. An electronic camera comprising: an imaging component which produces image data by imaging an object of imaging and which sends the image data thus produced to an image encoding device, wherein the image encoding device comprises:

a transformation component which transforms given image data into transformation coefficients by subjecting this data to a frequency decomposition,

a dividing component which divides the transformation coefficients produced by the transformation component into a selected region on the image and a non-selected region other than the selected region, and

an encoding component which encodes the transformation coefficients by preferentially allocating a greater quantity of information to the selected region than to the non-selected region, wherein

the dividing component performs an equation evaluation of numerical equation data that stipulates the boundary of the selected region, and determines whether the transformation coefficients belong to the selected region on the basis of the results of the equation evaluation.

8. The electronic camera of claim 7, wherein the dividing component comprises:

a numerical equation preparation component performs an edge detection for the image data, determines an outline on the basis of the results of this edge detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

9. The electronic camera of claim 7, wherein the dividing component comprises:
a numerical equation preparation component which performs a color boundary detection for the image data, determines an outline on the basis of the results of this color boundary detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

10. The electronic camera of claim 7, wherein the dividing component comprises:
a numerical equation preparation component which performs a space frequency component detection for the image data, determines an outline on the basis of the results of this space frequency component detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

11. The electronic camera of claim 7, wherein the encoding component forms a compressed image file from the combined encoded transformation coefficients and numerical equation data used by the dividing component.

12. A machine-readable recording medium comprising:
an image encoding program, wherein the image encoding program causes a computer to function as:

a transformation component which transforms given image data into transformation coefficients by subjecting this data to a frequency decomposition,

a dividing component which divides the transformation coefficients produced by the transformation component into a selected region on the image and a non-selected region other than the selected region, and

an encoding component which encodes the transformation coefficients by preferentially allocating a greater quantity of information to the selected region than to the non-selected region, wherein the dividing component performs an equation evaluation of numerical equation data that stipulates the boundary of the selected region, and determines whether the transformation coefficients belong to the selected region on the basis of the results of the equation evaluation.

13. The machine-readable recording medium of claim 12, wherein the dividing component comprises:

a numerical equation preparation component which performs an edge detection for the image data, determines an outline on the basis of the results of this edge detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

14. The machine-readable recording medium of claim 12, wherein the dividing component comprises:

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a numerical equation preparation component which performs a color boundary detection for the image data, determines an outline on the basis of the results of this color boundary detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

15. The machine-readable recording medium of claim 12, wherein the dividing component comprises:

a numerical equation preparation component which performs a space frequency component detection for the image data, determines an outline on the basis of the results of this space frequency component detection, and prepares numerical equation data that approximately expresses the outline, and

an equation evaluation component which performs an equation evaluation of the numerical equation data prepared by the numerical equation preparation component, and which makes a judgement on the basis of the equation evaluation results as to whether the transformation coefficients belong to the selected region.

16. The machine-readable recording medium of claim 12, wherein the encoding component forms a compressed image file from the combined encoded transformation coefficients and numerical equation data used by the dividing component.

17. The machine-readable recording medium comprising:

an image decoding program, wherein the image decoding program causes a computer to function as:

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a decoding component which reads out the encoded transformation coefficients from the compressed image file compressed by the image encoding device of claim 5 and decodes these transformation coefficients,

a re-dividing component which reads out the numerical equation data from the compressed image file compressed by the image encoding device of claim 5, performs an equation evaluation, and makes a judgement on the basis of the results of this equation evaluation as to whether the transformation coefficients decoded by the decoding component belong to the selected region,

an adjustment component which adjusts the form of expression of the transformation coefficients in the selected region and the form of expression of the transformation coefficients in the non-selected region in accordance with the division of the re-dividing component, and

a reverse transformation component which performs a reverse transformation on the image data using the transformation coefficients whose forms of expression have been adjusted by the adjustment component as sub-band components.